D-Link®

DGS-1008TL
8-Port 10/100/1000Mbps Gigabit Ethernet Switch

Manual

RECYCLABLE

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ABOUT THIS MANUAL

This manual will tell you how to install your D-Link DGS-1008TL 8-Port 10/100/1000Mbps Gigabit Ethernet Switch, and how to connect it to your Gigabit Ethernet network.

Terms

For simplicity, this documentation uses the terms “Switch” (first letter upper case) to refer to the DGS-1008TL 8-Port 10/100/1000Mbps Gigabit Ethernet Switch, and “switch” (first letter lower case) to refer to all Ethernet switches, including the DGS-1008TL 8-Port 10/100/1000Mbps Gigabit Ethernet Switch.

Overview of this Manaul

- *Introduction*. Describes the Switch and its features.
- *Unpacking and Setup*. Helps you get started with the basic installation of the Switch.
- *Identifying External Components*. Describes the front panel, rear panel, and LED indicators of the Switch.
- *Technical Specifications*. Lists the technical specifications of the Switch.

INTRODUCTION

This section describes the features of the DGS-1008TL 8-Port 10/100/1000Mbps Gigabit Ethernet Switch, as well as giving some background information about Gigabit Ethernet and switching technology.

Gigabit Ethernet Technology

Gigabit Ethernet is an extension of IEEE 802.3 Ethernet, utilizing the same packet structure, format, and support for CSMA/CD protocol, full-duplex mode, flow control, and management objects, but with a tenfold increase in theoretical throughput over 100Mbps Fast Ethernet and a hundredfold increase over 10Mbps Ethernet. Since it is backwards compatible with all 10Mbps and 100Mbps Ethernet environments, Gigabit Ethernet provides a straightforward upgrade without rendering a company's existing investment in hardware, software, and trained personnel obselete.

The increased speed and extra bandwidth offered by Gigabit Ethernet is essential to coping with the network bottlenecks that frequently develop as computers and their buses get faster and more users use high-bandwidth applications that generate more traffic. Upgrading key components, such as backbone and servers, to Gigabit Ethernet can greatly improve network response times as well as significantly speed up the traffic between your subnets.

Gigabit Ethernet supports video conferencing, complex imaging, and similar data-intensive applications. Likewise, since data transfers occur 10 times faster than Fast Ethernet, servers outfitted with Gigabit Ethernet NIC's are able to perform 10 times the number of operations in the same amount of time.

Switching Technology

Switching is a cost-effective way of increasing the total network capacity available to users on a LAN. If an Ethernet network begins to display symptoms of congestion, low throughput, slow response times, and high rates of collision, installing a switch to a network can preserve much or all of the existing network's cabling and workstation interface card infrastructure, while still greatly enhancing the throughput for users. A switch is a viable solution even if demanding applications, such as multimedia production and video conferencing, are on the horizon. The most promising techniques, as well as the best return on investment, could well consist of installing the right mixture of Ethernet switches.

A switch increases capacity and decreases network loading by dividing a local area network into different LAN segments. Dividing a LAN into multiple segments is one of the most common ways of increasing available bandwidth. If segmented correctly, most network traffic will remain within a single segment, enjoying the full-line speed bandwidth of that segment.

Switches provide full-line speed and dedicated bandwidth for all connections. This is in contrast to hubs, which use the traditional shared networking topology, where the connected nodes contend for the same network bandwidth. When two switching nodes are communicating, they are connected with a dedicated channel between them, so there is no contention for network bandwidth with other nodes. As a result, the switch reduces considerably, the likelihood of traffic congestion.

For Ethernet networks, a switch is an effective way of eliminating the problem of chaining hubs beyond the “two-repeater limit.” A switch can be used to split parts of the network into different collision domains, making it possible to expand your Ethernet network beyond the 205-meter network diameter limit for 100BASE-TX networks. Switches supporting both traditional 10Mbps Ethernet, 100Mbps Fast Ethernet, 1000Mbps Gigabit Ethernet are also ideal for bridging between existing 10Mbps networks, 100Mbps networks, and new 1000Mbps networks.

Switching LAN technology is a marked improvement over the previous generation of network hubs and bridges, which were characterized by higher latencies. Routers have also been used to segment local area networks, but the cost of a router, the setup and maintenance required, make routers relatively impractical. Today switches are an ideal solution to most kinds of local area network congestion problems.

Features

The DGS-1008TL 8-Port 10/100/1000Mbps Gigabit Ethernet Switch was designed for easy installation and high performance in an environment where traffic on the network and the number of users increase continuously.

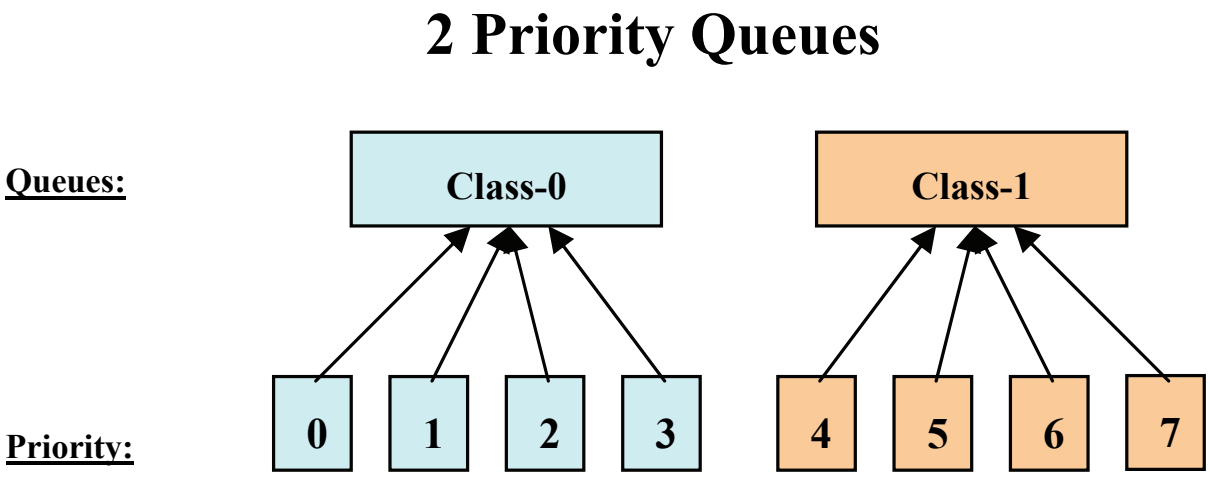
- Eight 10/100/1000Mbps Auto-negotiating, Auto-MDI/MDIX Ethernet ports
- Full/half duplex transfer mode for 10Mbps and 100Mbps
- Full duplex transfer mode for 1000Mbps
- Wire speed reception and transmission
- Store-and-Forward switching method
- Integrated address look-Up engine, supports 4K absolute MAC addresses
- Supports 128KBytes data buffer per device
- Extensive front-panel diagnostic LEDs
- IEEE 802.3x flow control for full-duplex
- Back pressure flow control for half duplex
- IEEE 802.1p priority queues
- Jumbo Frame Support (9000Bytes)

IEEE802.1P AND QOS

The DGS-1008TL Switches support 802.1p priority queuing Quality of Service. The implementation of QoS (Quality of Service) and benefits of using 802.1p priority queuing are described here.

Advantages of QoS

QoS is an implementation of the IEEE 802.1p standard that allows network administrators a method of reserving bandwidth for important functions that require a large bandwidth or have a high priority, such as VoIP (voice-over Internet Protocol), web browsing applications, file server applications or video conferencing. Not only can a larger bandwidth be created, but other less critical traffic can be limited, so bandwidth can be saved. The Switch has separate hardware queues on every physical port to which packets from various applications are mapped to and assigned a priority. The illustration below shows how 802.1P priority queuing is implemented on the Switch. The eight IEEE 802.1P priority levels defined by the standard are mapped to the two class queues used in the Switch.



Mapping QoS on the Switch

The picture above shows the default priority setting for the Switch. Class-1 has the higher priority than Class-0 on the Switch. In order to implement QoS, the user is required to instruct the Switch to examine the header of a packet to see if it has the proper identifying tag tagged. Then the user may forward these tagged packets to designated queues on the Switch where they will be emptied, based on priority.

"The untagged pkt will follow the priority 0 to work (i.e. class 0)."

Understanding QoS

The Switch has two priority queues labeled as 1, higher queue and 0, lower queue. The eight priority tags, specified in IEEE 802.1p are mapped to the Switch's priority tags as follows:

Priority 0 is assigned to the Switch's Q0 queue.

Priority 1 is assigned to the Switch's Q0 queue.

Priority 2 is assigned to the Switch's Q0 queue.

Priority 3 is assigned to the Switch's Q0 queue.

Priority 4 is assigned to the Switch's Q1 queue.

Priority 5 is assigned to the Switch's Q1 queue.

Priority 6 is assigned to the Switch's Q1 queue.

Priority 7 is assigned to the Switch's Q1 queue.

The Switch uses strict priority for Scheduling. Strict priority-based scheduling, any packets residing in the higher priority queues are transmitted first.

UNPACKING AND SETUP

This chapter provides unpacking and setup information for the Switch.

Unpacking

Open the shipping carton of the Switch and carefully unpack its contents. The carton should contain the following items:

- One DGS-1008TL 8-Port 10/100/1000Mbps Gigabit Ethernet Switch
- Accessory pack: 2 mounting brackets and screws
- Four rubber feet with adhesive backing
- One AC power cord
- Quick Installation Guide
- This manual

If any item is missing or damaged, please contact your local reseller for replacement.

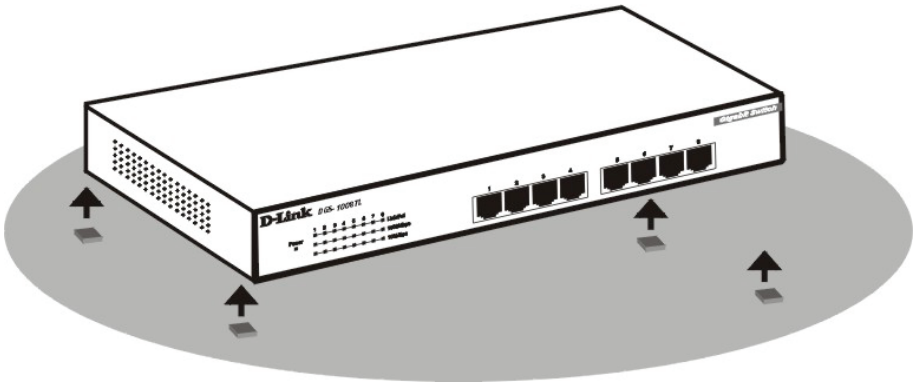
Setup

The setup of the Switch can be performed using the following steps:

- The surface must support at least 5 kg (11.02 lbs).
- The power outlet should be within 1.82 meters (6 feet) of the device.
- Visually inspect the power cord and see that it is secured fully to the AC power connector.
- Do not cover the ventilation holes on the sides of the Switch, and make sure there is adequate ventilation around it.
- Do not place heavy objects on the Switch.

Desktop or Shelf Installation

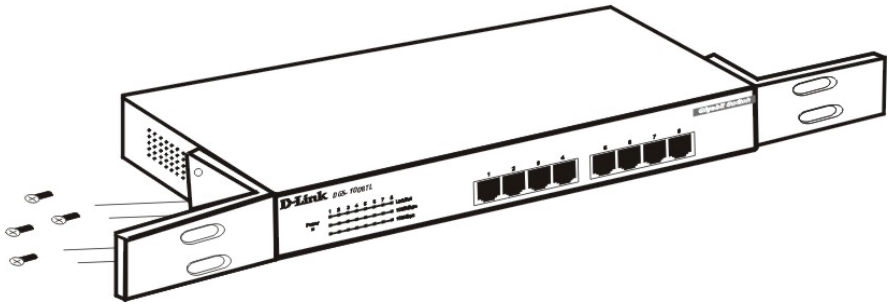
When installing the DGS-1008TL on a desktop or shelf, the rubber feet included with the device must be attached first. Attach these feet on the bottom at each corner of the device.



Gigabit Ethernet Switch installed on a Desktop or Shelf

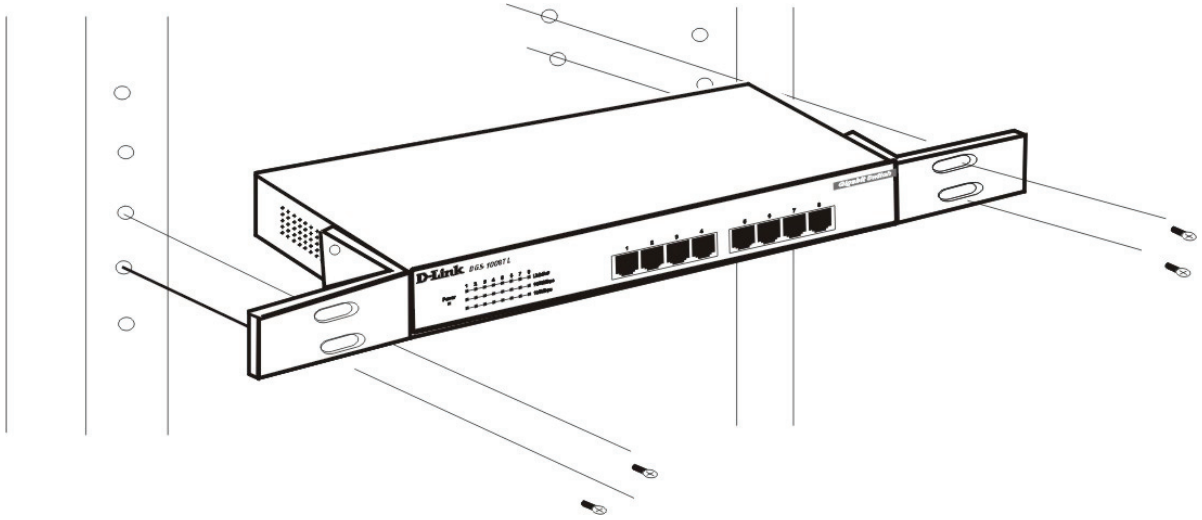
Rack Installation

The Switch can be mounted in an EIA standard size, 19-inch rack, which can be placed in a wiring closet with other equipment. To install, attach the mounting brackets on the switch's front panel (one on each side) and secure them with the screws provided.



Attaching the mounting brackets to the Switch

Then, use the screws provided with the equipment rack to mount the Switch in the rack.

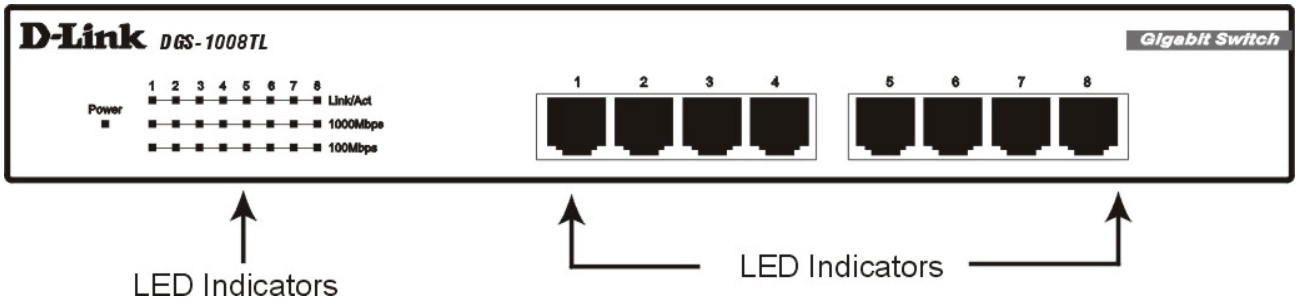


Installing the Switch in an equipment rack

IDENTIFYING EXTERNAL COMPONENTS

This chapter describes the front panel, rear panel and LED indicators of the Switch

Front Panel

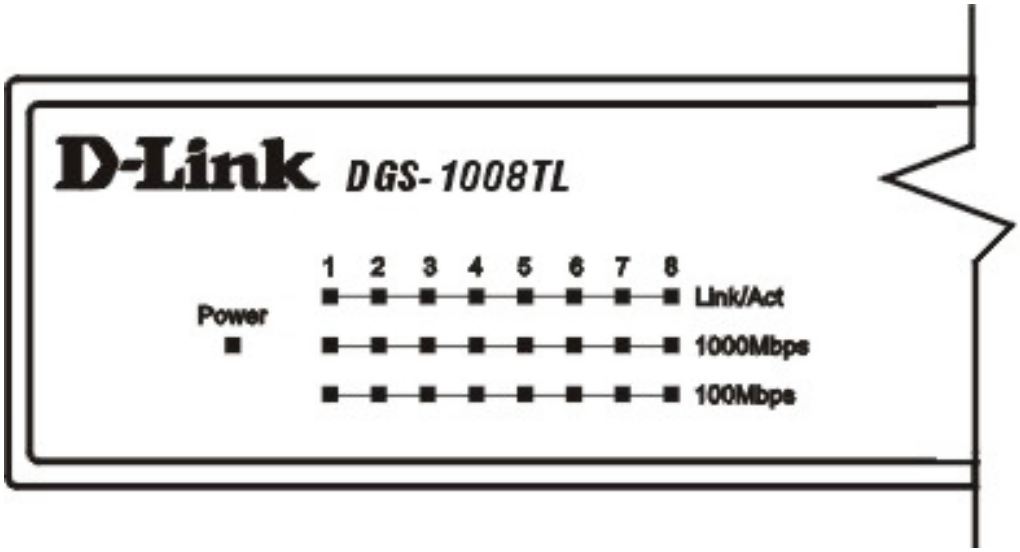


Front panel view of the Switch

- Eight Gigabit Ethernet ports of 10/100/1000Mbps Auto-Negotiation.
- Comprehensive LED indicators that display the conditions of the Switch and status of the network. A description of these LED indicators follows (see *LED Indicators*).

LED Indicators

The LED indicators of the DGS-1008TL include Power, Link/Act, and Speed at 100/1000Mbps. The following shows the LED indicators for the Switch along with an explanation of each indicator.



The Switch LED indicators

Per unit:

- **Power:**

  A steady green light indicates the switch is power on.

Per port:

- **Link/Act:**

  A steady green light indicates that the corresponding port is connected and a valid link is established. This will blink green when there is activity on the port.

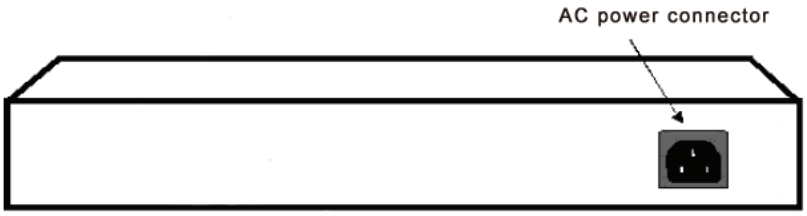
- **1000Mbps:**

  The steady green light indicates that the corresponding port is connected at 1000Mbps.

- **100Mbps:**

  The steady green light indicates the corresponding port is connected at 100Mbps.

Rear Panel



The rear panel of the Switch

- **AC Power Connector** This is a three-pronged connector that supports the power cord. Supported input voltages range from 100 ~ 240 VAC at 50 ~ 60 Hz.

TECHNICAL SPECIFICATIONS

General			
Standards:	IEEE 802.3 10BASE-T IEEE 802.3u 100BASE-TX IEEE 802.3ab 1000BASE-T		
Protocol:	CSMA/CD		
Data Transfer Rate:	Ethernet:	10Mbps	(Half-duplex)
		20Mbps	(Full-duplex)
	Fast Ethernet:	100Mbps	(Half-duplex)
		200Mbps	(Full-duplex)
	Gigabit Ethernet:	2000Mbps	(Full-duplex)
Topology:	Star		
Network Cables:	Ethernet:	2-pair UTP Cat. 3,4,5, EIA/TIA-568 100-ohm screened twisted-pair (STP)	
	Fast Ethernet:	2-pair UTP Cat. 5, EIA/TIA-568 100-ohm screened twisted-pair (STP)	
	Gigabit Ethernet:	4-pair UTP Cat. 5, EIA/TIA-568 100-ohm screened twisted-pair (STP)	
Number of Ports:	Eight (8) 10/100/1000Mbps Auto-Negotiating Ports		

Physical and Environmental	
AC inputs:	100 – 240 VAC Universal, 50/60 Hz
Power Consumption:	10.3 watts maximum
Operating Temperature:	0° ~ 40°C (32°-104° F)
Storage Temperature:	-10° ~ 70°C (14°-158° F)
Humidity:	5% ~ 90% RH, non-condensing
Dimensions:	11.02 x 7.09 x 1.73 inches (280 mm x 180 mm x 44 mm), 1U
EMI:	FCC Class A, CE, VCCI
Safety:	cUL

Performance	
Transmission Method:	Store-and-forward
RAM Buffer:	128KBytes per device
Filtering Address Table:	4K MAC address per device
Packet Filtering/Forwarding Rate:	Full wire speed
MAC Address Learning:	Self-learning, auto-aging